SECRET

ILLEGIB

6 May 1960

MEMORANDUM FOR RECORD

SUBJECT : Trip Report to HRB

1. The undersigned accompanied by Commander Walter Crandall, Navy Bu Weaps, visited HRB Singer on 4 May 1960. The purpose of this visit was to review progress that had been made on the VHF and S-band pan-scope equipment for Model 8X. Good progress had been made on the VHF system and it was ready for demonstration. This system was very carefully checked by the undersigned and was found to have the following technical capabilities: For CW signals it had a tangential sensitivity of -108 dbm over the frequency range 58-90 Mc/s. At a signal level of -90 dbm a little brother appeared adjacent to the signal at 72 Mc/s. At a signal level of -80 dbm the little brother remained over the frequency range of 60-80 Mc/s. At a signal level of -75 dbm the little brother trailed the main signal by 30 Mc/s. At a signal level of -70 dbm the little brother appeared on either side of the main signal. At a signal level of -65 dbm the little brother effect was so severe as to limit the usefulness of the pan display. At a signal level of -60 dbm the pan-scope was completely saturated by little brother type signals. Perhaps more meaningfull are the pulse characteristics of the VHF pan-scope. These are listed below: The minimum useful range of the scope was found to be from a signal level of a -95 dbm to a signal level greater than a -50 dbm. A 48 channel type telemetry sync signal was used for these tests. A later discussion disclosed that an IF bandwith of only 350-400 Kc/s was being used along with a linear detector and a video amplifier with a bandwidth of approximately 175 Kc/s. There was some doubt in the mind of the undersigned that this limited bandwidth was really justified and the HRB engineers were asked to re-check the system to determine whether if indeed this narrow bandwidth was the optimum for recognition of the presence of telemetry type signals.

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2. The S-band pan system was almost complete but was awaiting the receipt of a new Hybrid multiplexer. This unit used a tunable magnetron operating over the frequency range of 2350-2550. As a local oscillator the first IF is 350 Mc/s. The power output of this magnetron was -3 dbm. In order to isolate the magnetron from the two TN 129's which operate in parallel with the pan system two 15 db ferrite isolators were used in tandem in the RF input to the pan receivers mixer. The Hybrid multiplexer gives 23 db isolation and each of the TN 129's had a 15 db isolation in its RF input. Thus, 68 db of isolation was provided between the tunable magnetron and the two TN 129's. This isolation is considered to be sufficient in view of the fact that the useful range of the TN 129's and the traveling wave tube pre-amplifier was designed for the 2700-2900 Mc/s band. The S-band system should be completed some time during the week of 9 May.

25X1 [redacted] will make the final check on this system.

3. The super sensitive "auto correlation techniques" circuitry was demonstrated and it appeared to give approximately a 10 db increase in system sensitivity. The following instructions were left for the use of this system: The 55 Kc/s tone which was to be amplitude modulated by the output of the correlated data channel signal was to be set at a signal off level of 6 db above tape noise. The amplitude of this 55 Kc/s tone was to be compressed so that the total dynamic range of the system (approximately 40 db) would be compressed to the 21 db of dynamic range left on the tape above the 6 db level.

25X1 [redacted]